US011819465B2

(12) **United States Patent**
Cohen

(10) **Patent No.: US 11,819,465 B2**
(45) **Date of Patent: Nov. 21, 2023**

(54) **LIFT CHAIR ASSEMBLY**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 292 days.

(21) Appl. No.: **16/928,287**

(22) Filed: **Jul. 14, 2020**

(65) **Prior Publication Data**

US 2022/0015970 A1 Jan. 20, 2022

(51) **Int. Cl.**

A61G 5/14	(2006.01)
A61G 5/10	(2006.01)
A47C 1/032	(2006.01)
A47C 1/024	(2006.01)
A61G 7/053	(2006.01)
A61G 7/10	(2006.01)
A47C 7/00	(2006.01)
A47C 7/62	(2006.01)

(52) **U.S. Cl.**

CPC ***A61G 5/14*** (2013.01); ***A47C 1/024*** (2013.01); ***A47C 1/03205*** (2013.01); ***A61G 5/107*** (2013.01); ***A61G 5/1072*** (2013.01); *A47C 7/002* (2013.01); *A47C 7/62* (2013.01); *A61G 7/053* (2013.01); *A61G 7/1019* (2013.01)

(58) **Field of Classification Search**

None

See application file for complete search history.

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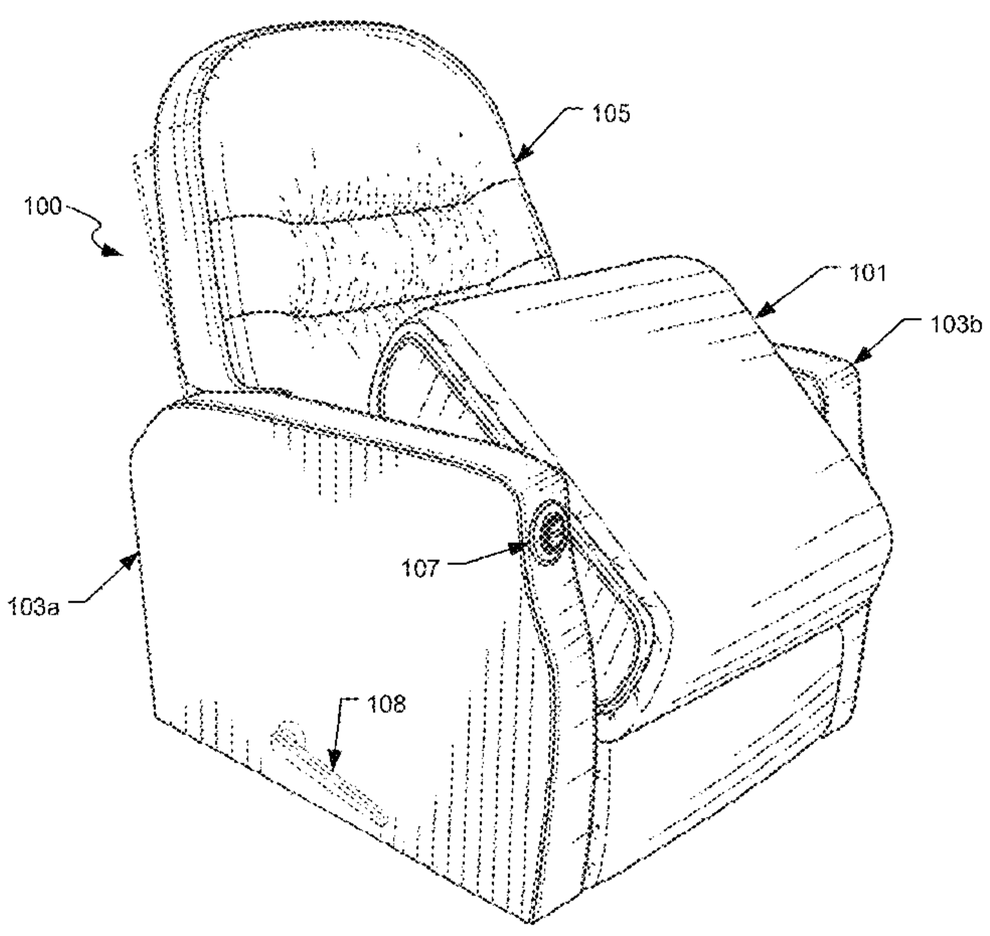
(57) **ABSTRACT**

Embodiments of the present invention disclose a lift chair assembly for assisting a user to transition between sitting and standing. The assembly includes a frame body, a backrest member coupled to the frame body, a seat member coupled to the frame body and configured to pivot about an axis relative to the frame body independently from the backrest member such that the seat member pivots between a neutral position and an elevated position, a motor that selectively pivots the seat member, and a controller that selectively engages the motor to pivot the seat member.

17 Claims, 10 Drawing Sheets



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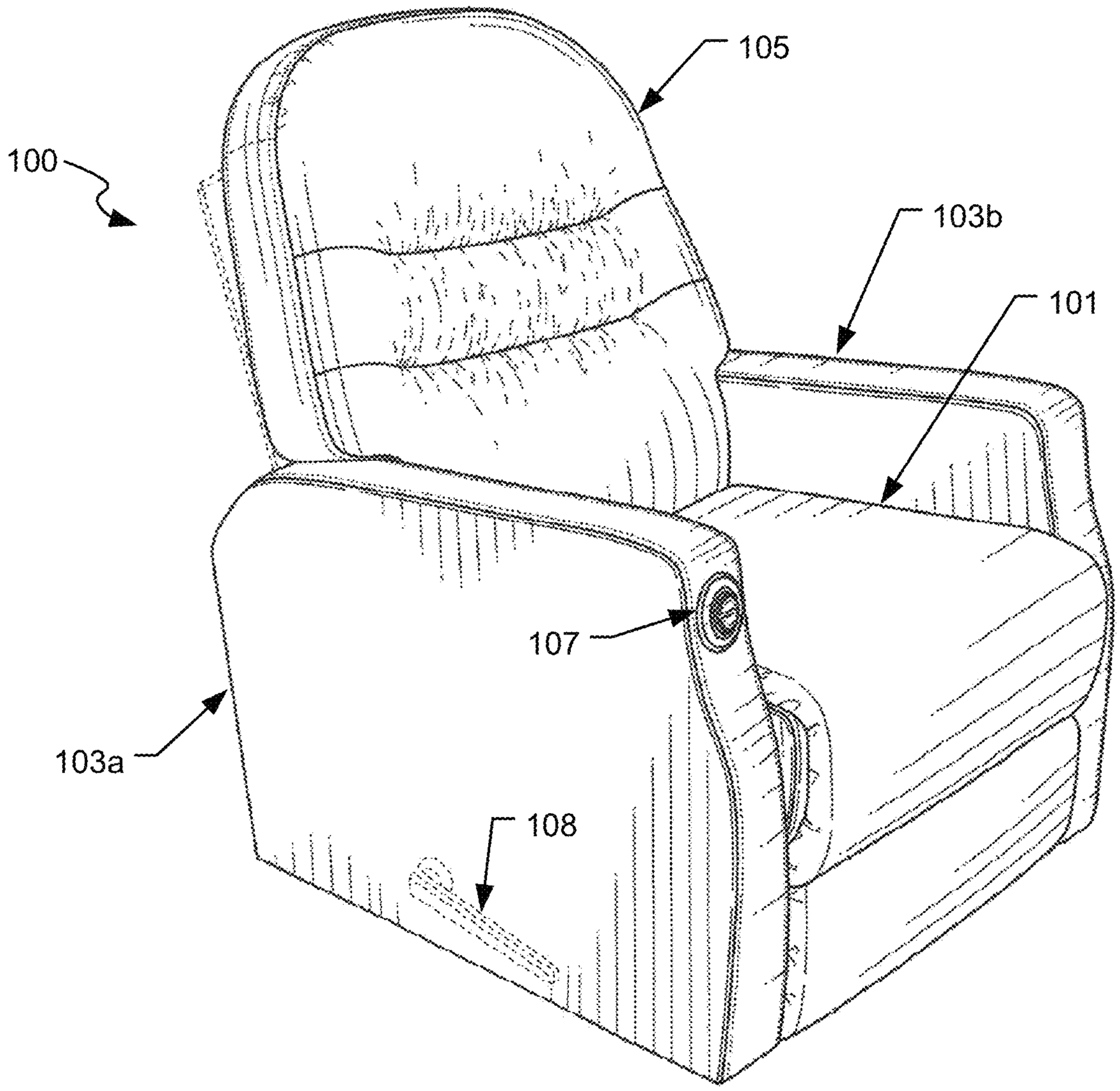

FIG. 1

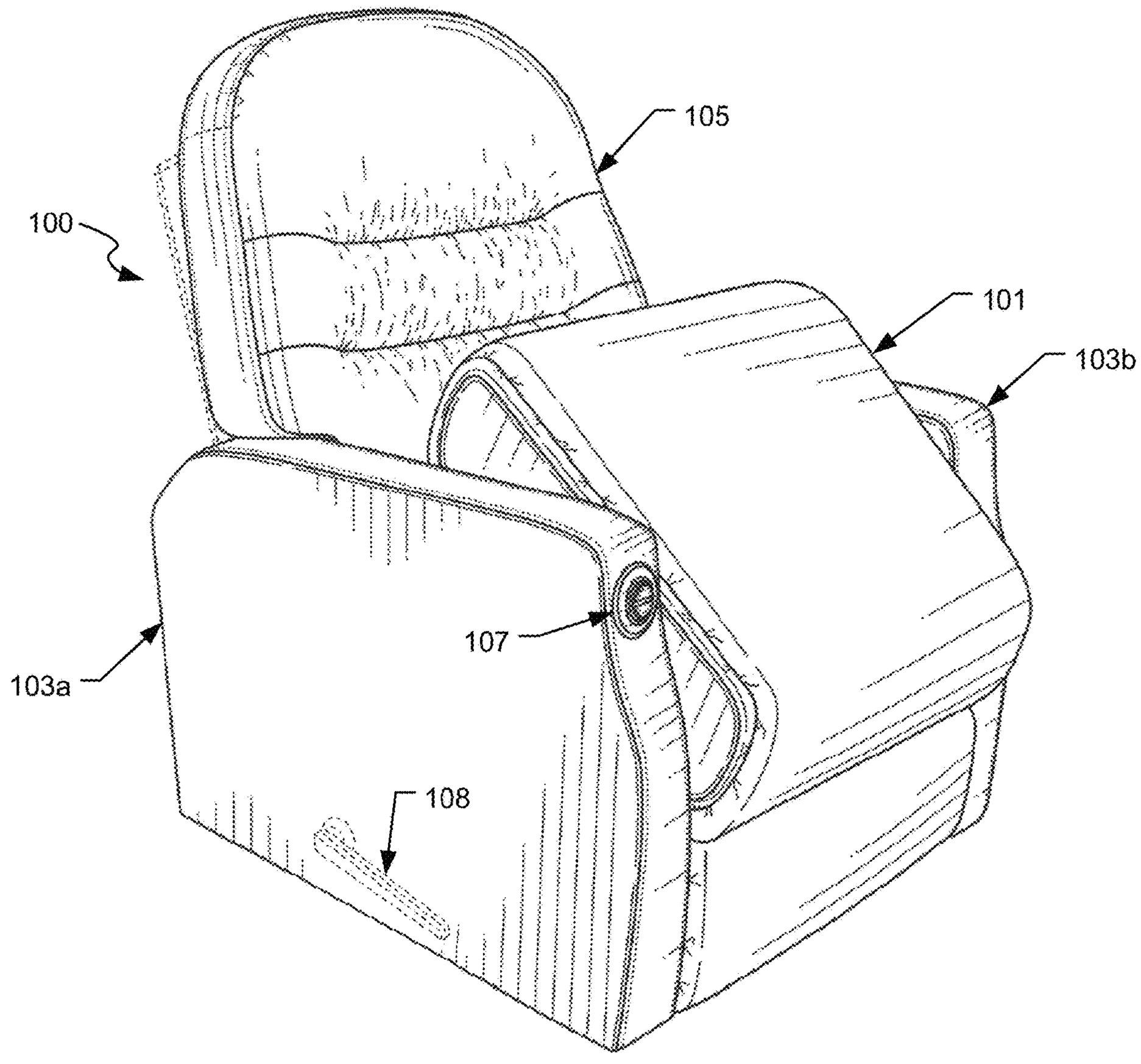

FIG. 2

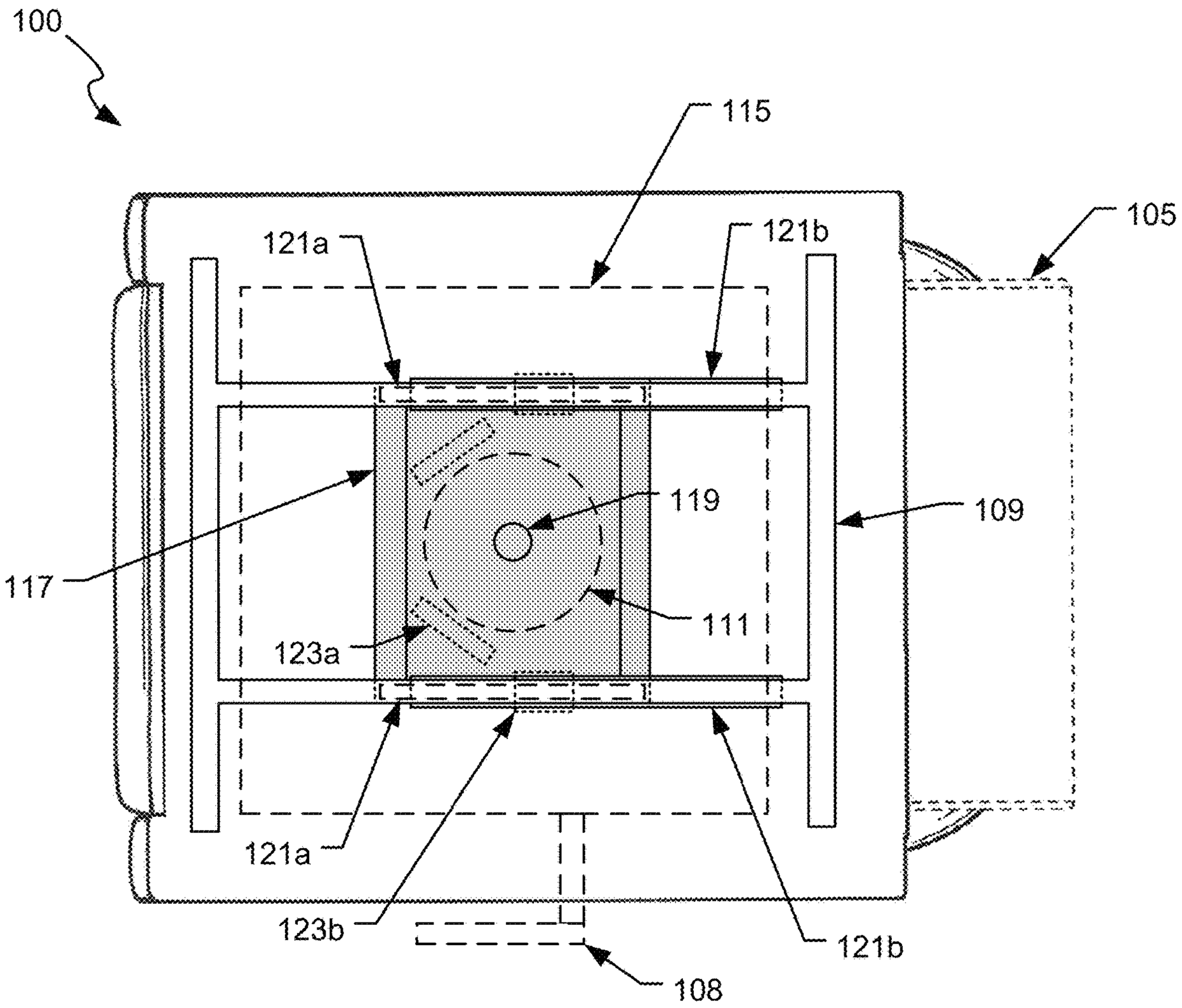

FIG. 3

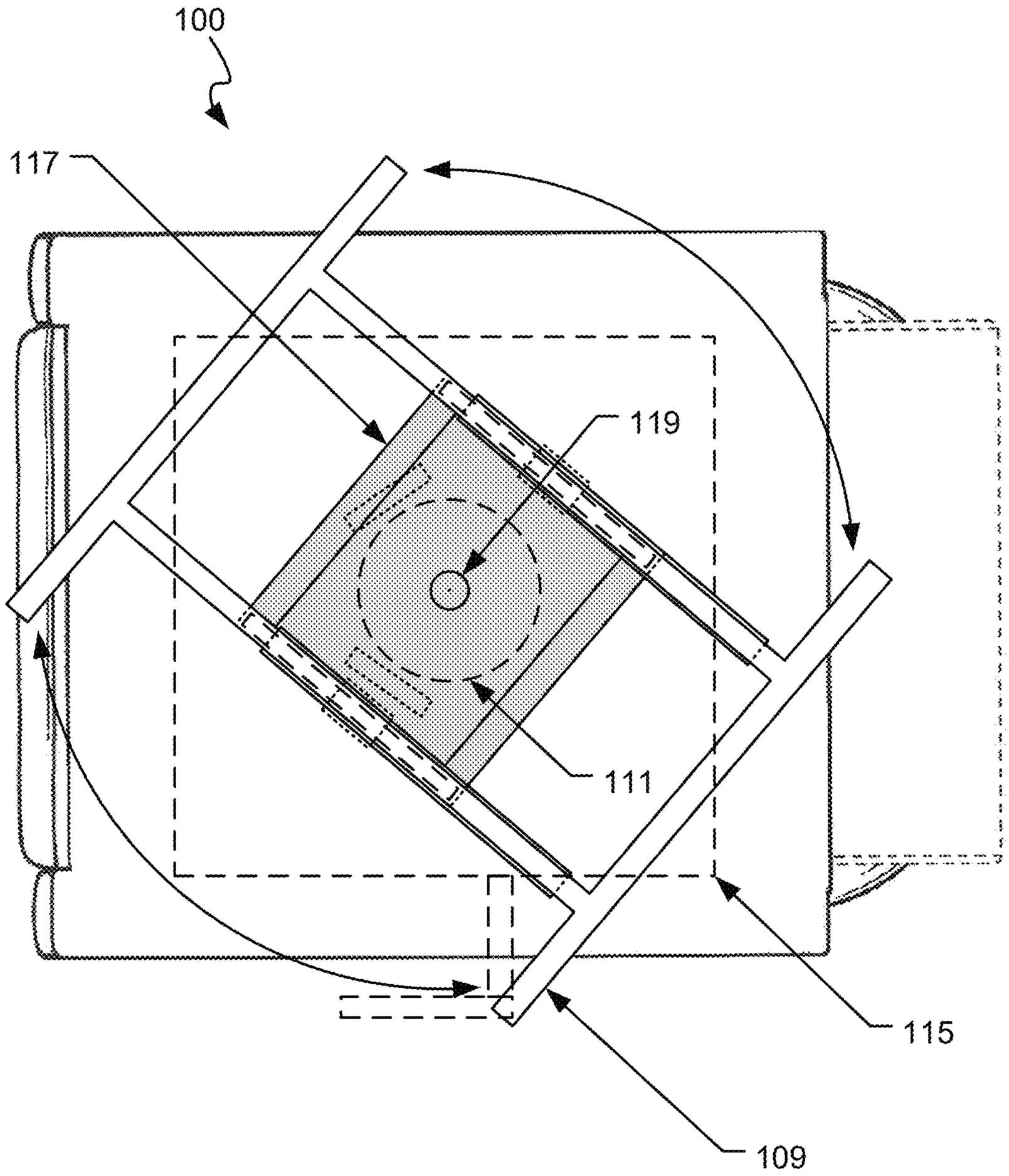

FIG. 4

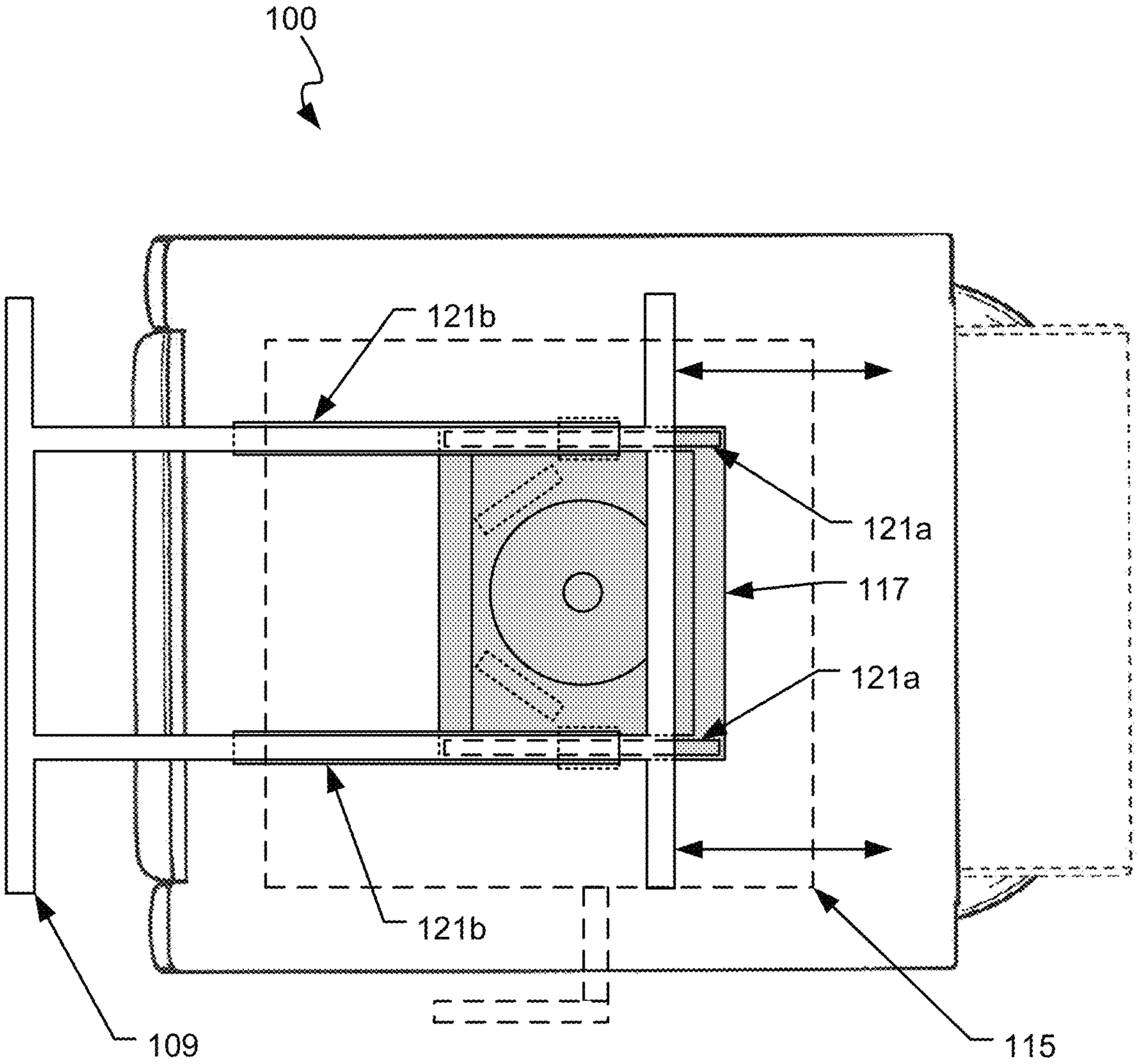

FIG. 5

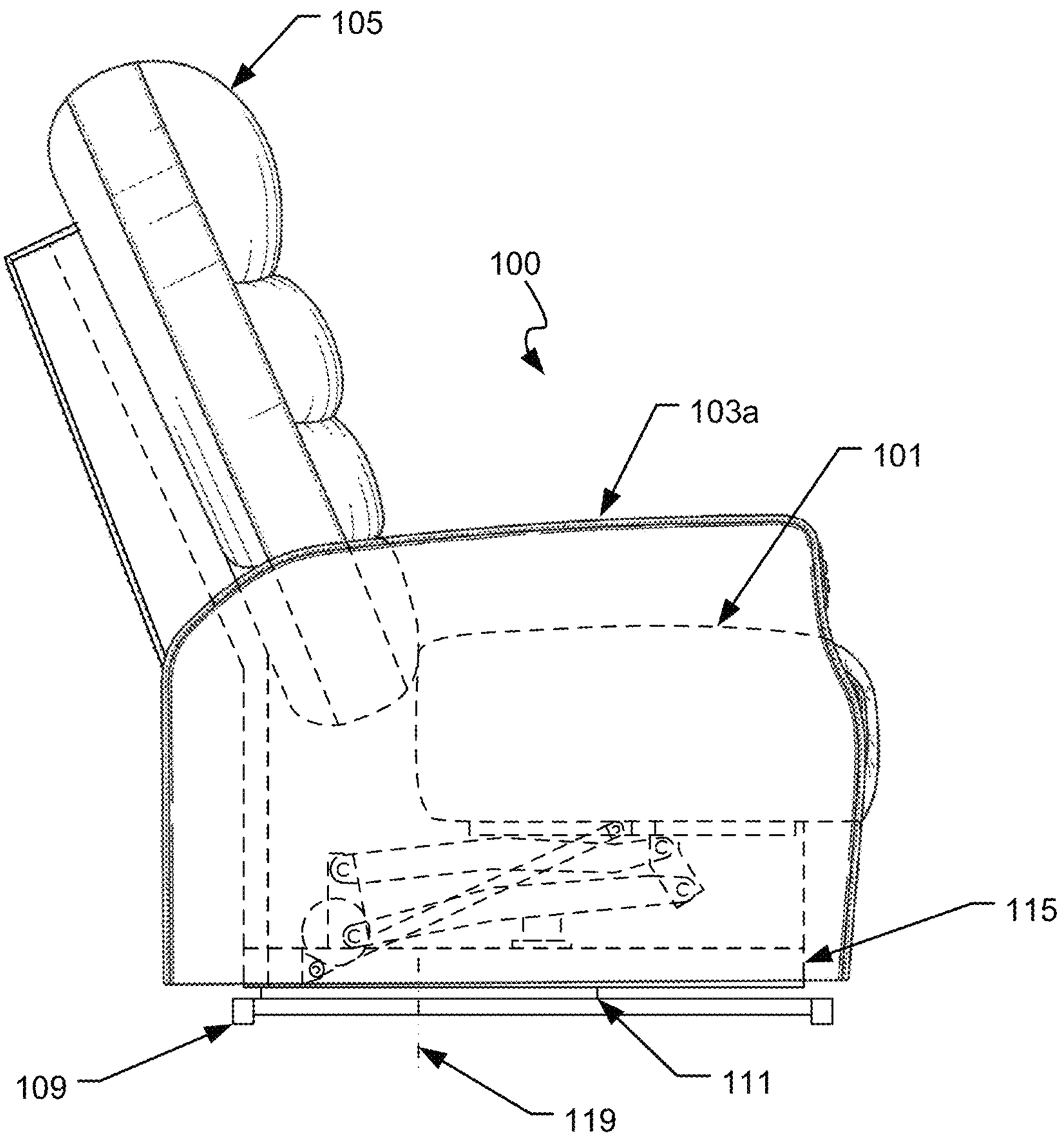

FIG. 6

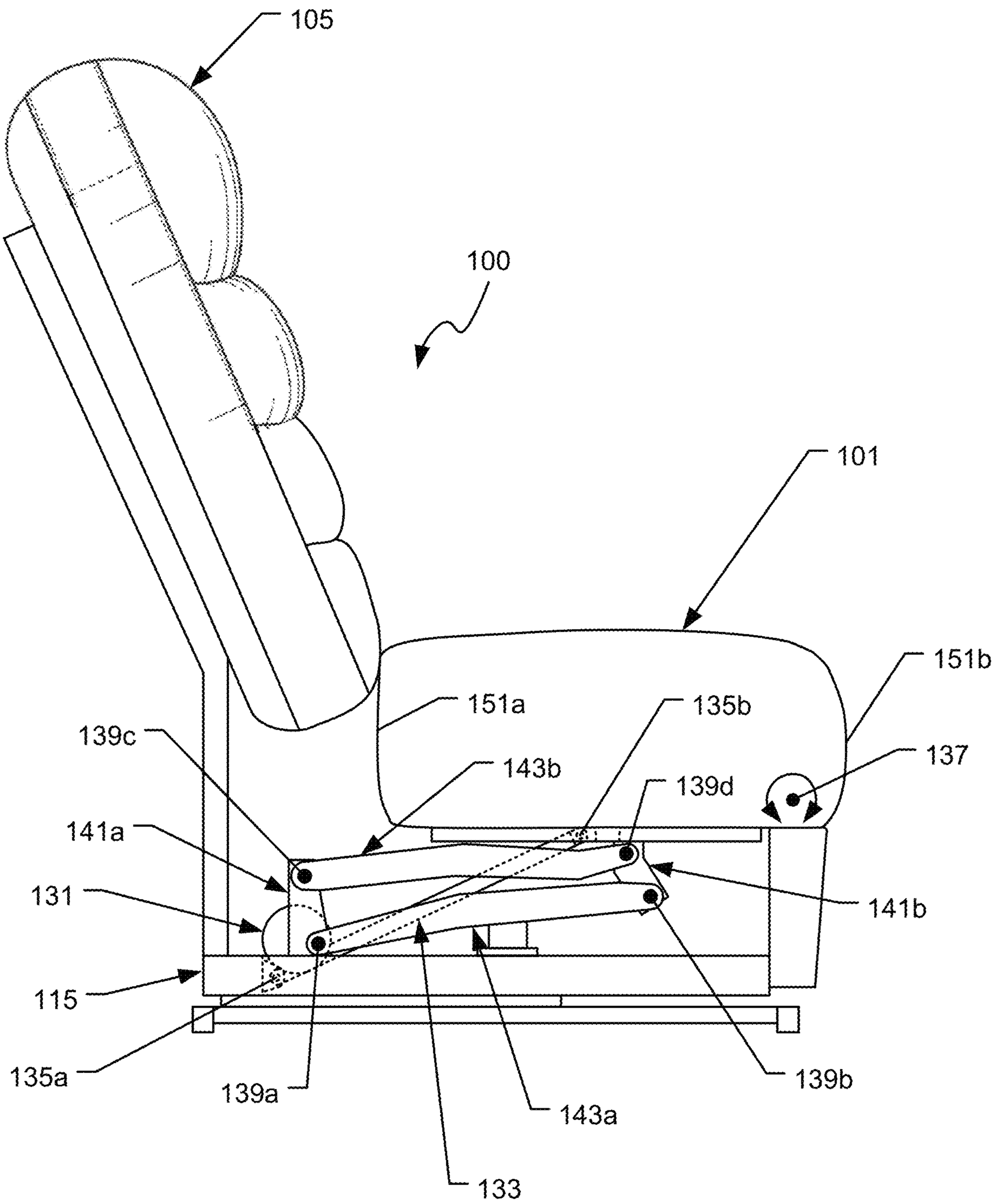
105
100
101
151b
151a
135b
139c
137
143b
139d
141a
131
141b
115
135a
139a
143a
139b
133

FIG. 7

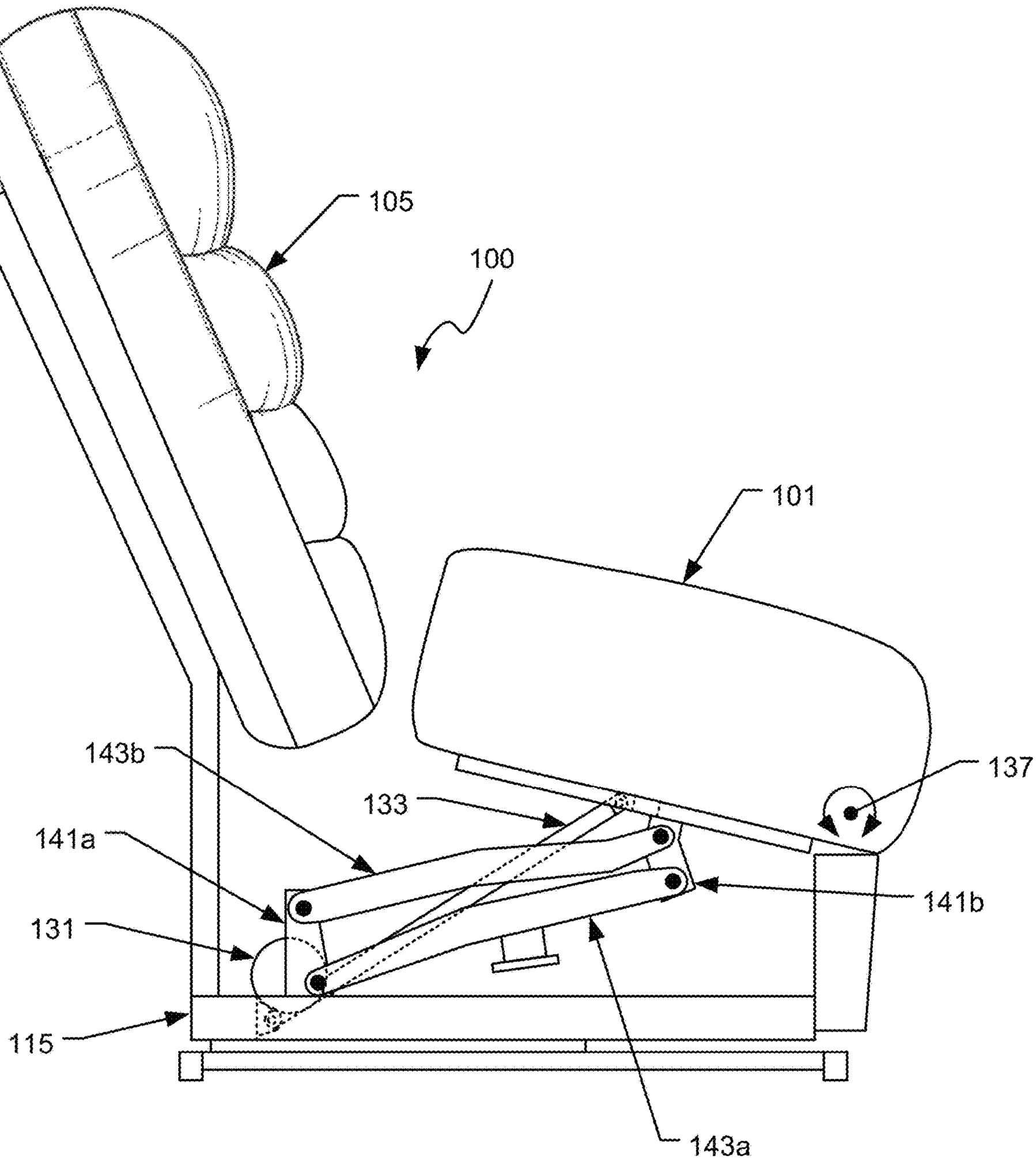

FIG. 8

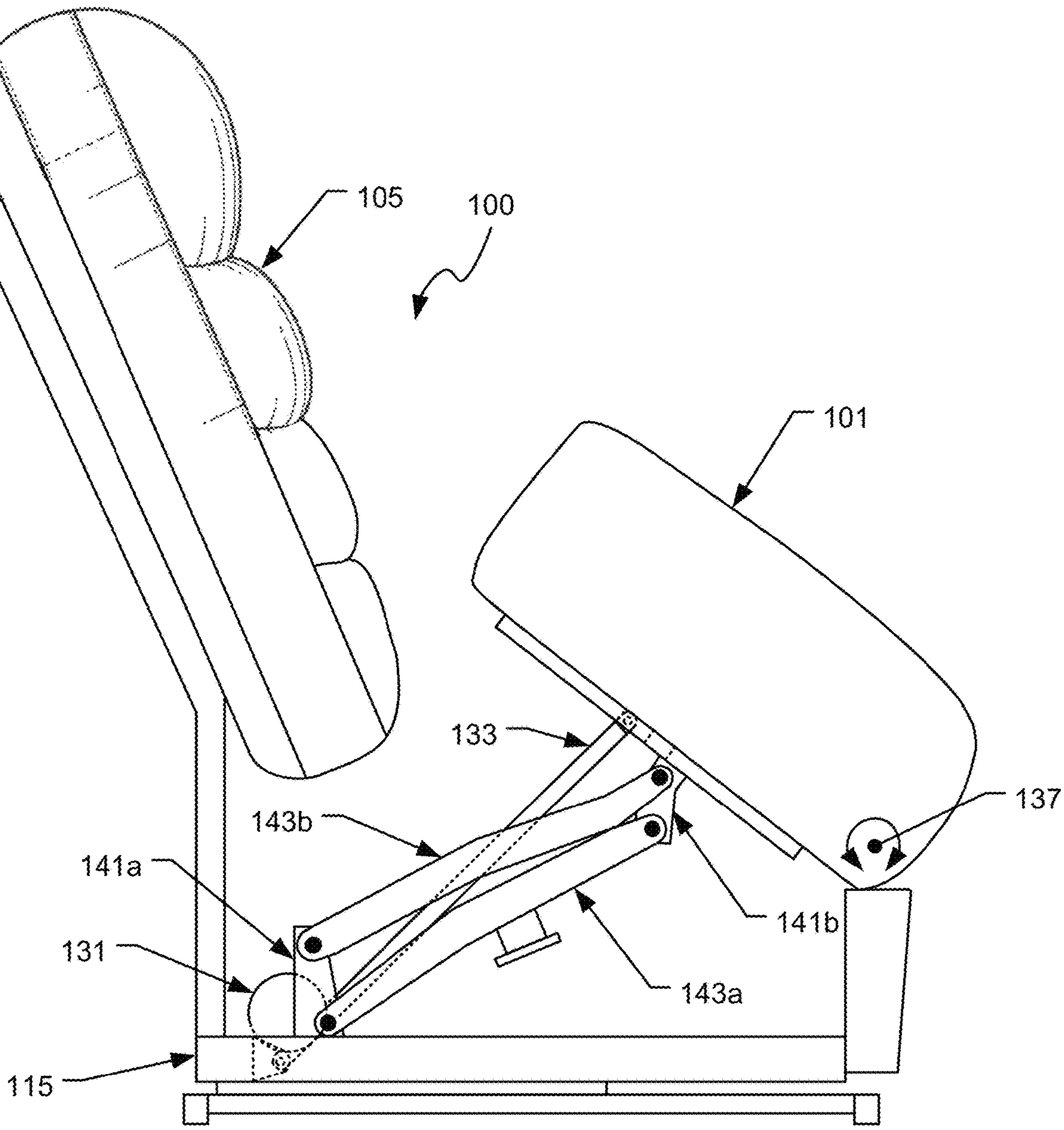

FIG. 9

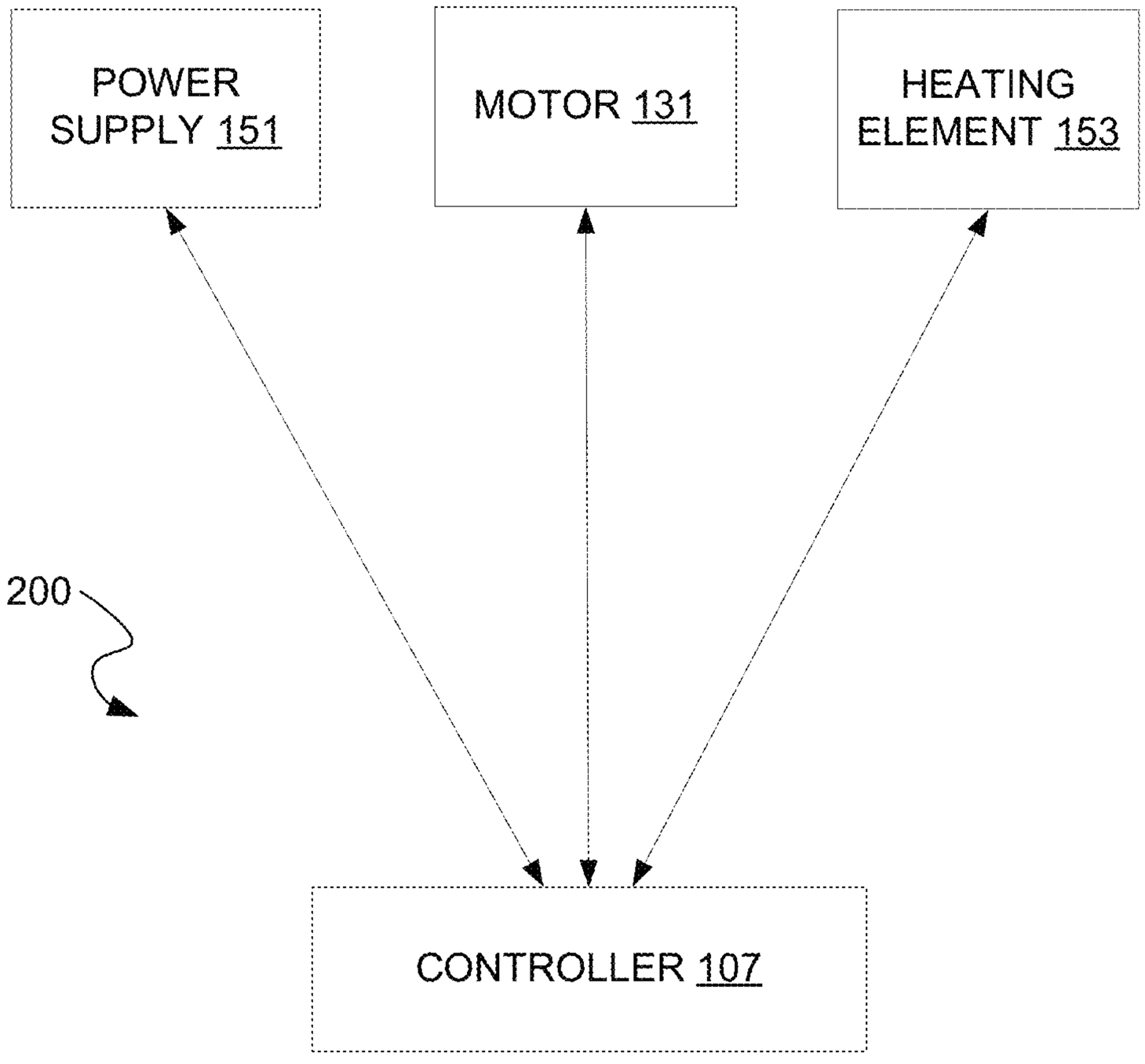
POWER SUPPLY 151
MOTOR 131
HEATING ELEMENT 153
200
CONTROLLER 107

FIG. 10

LIFT CHAIR ASSEMBLY

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present application relates to chairs in general, and particularly to lift chairs.

2. Description of Related Art

The aged and disabled frequently have difficulty standing up and sitting down due to weakened muscles and/or poor joint mobility. To assist these persons between sitting and standing, lift chairs have been developed. Typical lift chairs known in the art have a chair body and a lifting mechanism that simultaneously raises and tilts the chair to permit an angle that is easier for a user to transition from sitting and standing. In most cases, the chair body includes a seat, a backrest, and two armrests that are permanently coupled to each other and maintain its configuration during operation; however, such lift chairs that tilt the entire chair body can become unstable. As such these lift chairs require further designs to include counterweights and stability devices, thus adding more components to a system, subsequently affecting manufacturing costs. Although strides have been made to develop lift chairs, some shortcomings remain. Thus, a simplified system is desired that also maintains the safety of the user.

BRIEF SUMMARY OF THE INVENTION

It is an object of the present application to provide a lift chair assembly for assisting a user to transition between sitting and standing, the assembly comprising: a frame body, a backrest member coupled to the frame body, a seat member coupled to the frame body and configured to pivot about an axis relative to the frame body independently from the backrest member such that the seat member pivots between a neutral position and an elevated position, a motor that selectively pivots the seat member, and a controller that selectively engages the motor to pivot the seat member.

Ultimately the invention may take many embodiments. In these ways, the present invention overcomes the disadvantages inherent in the prior art.

The more important features have thus been outlined in order that the more detailed description that follows may be better understood and to ensure that the present contribution to the art is appreciated. Additional features will be described hereinafter and will form the subject matter of the claims that follow.

Many objects of the present application will appear from the following description and appended claims, reference being made to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Before explaining at least one embodiment of the present invention in detail, it is to be understood that the embodiments are not limited in its application to the details of construction and the arrangements of the components set forth in the following description or illustrated in the drawings. The embodiments are capable of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

As such, those skilled in the art will appreciate that the conception, upon which this disclosure is based, may readily be utilized as a basis for the designing of other structures, methods, and systems for carrying out the various purposes of the present design. It is important, therefore, that the claims be regarded as including such equivalent constructions in so far as they do not depart from the spirit and scope of the present application.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the application are set forth in the appended claims. However, the application itself, as well as a preferred mode of use, and further objectives and advantages thereof, will best be understood by reference to the following detailed description when read in conjunction with the accompanying drawings, wherein:

FIG. **1** is a perspective view of a chair assembly with a seat member in a neutral position, in accordance with an embodiment of the present application;

FIG. **2** is a perspective view of the chair assembly of FIG. **1** with the seat member in an elevated position;

FIG. **3** is a bottom view of the chair assembly of FIG. **1** illustrating a base member;

FIG. **4** is a bottom view of the chair assembly of FIG. **1** illustrating rotation of the base member;

FIG. **5** is a bottom view of the chair assembly of FIG. **1** illustrating translation of the base member;

FIG. **6** is a side view of the chair assembly of FIG. **1**;

FIG. **7** is a cutaway view of the chair assembly of FIG. **6** with the seat member in the neutral position;

FIG. **8** is a cutaway view of the chair assembly of FIG. **6** with the seat member located between the neutral and elevated positions;

FIG. **9** is a cutaway view of the chair assembly of FIG. **6** with the seat member in the elevated position; and

FIG. **10** is a functional block diagram illustrating a network environment.

While the embodiments of the present application are susceptible to various modifications and alternative forms, specific embodiments thereof have been shown by way of example in the drawings and are herein described in detail. It should be understood, however, that the description herein of specific embodiments is not intended to limit the application to the particular embodiment disclosed, but on the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the process of the present application as defined by the appended claims.

DETAILED DESCRIPTION OF THE INVENTION

Illustrative embodiments of the preferred embodiment are described below. In the interest of clarity, not all features of an actual implementation are described in this specification. It will of course be appreciated that in the development of any such actual embodiment, numerous implementation-specific decisions must be made to achieve the developer's specific goals, such as compliance with system-related and business-related constraints, which will vary from one implementation to another. Moreover, it will be appreciated that such a development effort might be complex and time-consuming but would nevertheless be a routine undertaking for those of ordinary skill in the art having the benefit of this disclosure.

In the specification, reference may be made to the spatial relationships between various components and to the spatial orientation of various aspects of components as the devices are depicted in the attached drawings. However, as will be recognized by those skilled in the art after a complete reading of the present application, the devices, members, apparatuses, etc. described herein may be positioned in any desired orientation. Thus, the use of terms to describe a spatial relationship between various components or to describe the spatial orientation of aspects of such components should be understood to describe a relative relationship between the components or a spatial orientation of aspects of such components, respectively, as the embodiments described herein may be oriented in any desired direction.

The method and system in accordance with the present invention overcome one or more of the above-discussed problems associated with lift chairs. In particular, the system of the present invention is a lift chair that pivots a seat member independently from a backrest member, thus avoiding having to unnecessarily lift the entire chair during operation.

The method and system will be understood from the accompanying drawings, taken in conjunction with the accompanying description. Several embodiments of the system may be presented herein. It should be understood that various components, parts, and features of the different embodiments may be combined together and/or interchanged with one another, all of which are within the scope of the present application, even though not all variations and particular embodiments are shown in the drawings. It should also be understood that the mixing and matching of features, elements, and/or functions between various embodiments are expressly contemplated herein so that one of ordinary skill in the art would appreciate from this disclosure that the features, elements, and/or functions of one embodiment may be incorporated into another embodiment as appropriate unless otherwise described.

The system of the present application is illustrated in the associated drawings. As used herein, "system" and "assembly" are used interchangeably. It should be noted that the articles "a", "an", and "the", as used in this specification, include plural referents unless the content clearly dictates otherwise. Additional features and functions are illustrated and discussed below.

Referring now to the drawings wherein like reference characters identify corresponding or similar elements in form and function through the several views. FIGS. **1-6** illustrate external views of a lift chair assembly. FIGS. **7-9** illustrate the internal components of the lift chair assembly.

Referring now to FIG. **1**, a perspective view of chair assembly **100** with a seat member in a neutral position is illustrated in accordance with an embodiment of the present invention.

In FIG. **1**, chair assembly **100** is a lift chair comprising seat member **101**, backrest **105**, armrests **103***a-b*, each in communication with a frame body that structurally maintains the lift chair. In this figure, controller **107** is integrated on armrest **103***a*, wherein controller **107** has button inputs for controlling several features of chair assembly **100** including, but not limited to, selectively engaging a motor that pivots seat member **101** about an axis, regulating the driving speed of the motor, and regulating the direction of the motion of the seat member. Further connections and enabling components are further depicted in FIGS. **7-9**. In this figure, seat member **101** is in a neutral position, wherein the neutral position is a configuration typically found with chairs suitable for a user to sit.

Optionally, chair assembly **100** may include brake lever **108** that is pivotably connected the frame body, wherein brake lever **108** is in communication with a set of brake members that are configured to selectively resist a base member from pivoting and/or translating with respect to the frame body. Brake lever **108** and its features are further illustrated and described in FIGS. **3-5**.

Referring now to FIG. **2**, a perspective view of chair assembly **100** with a seat member in an elevated position is illustrated.

In general, chair assembly **100** operates as a lift chair by having the seat member coupled to a frame body and configured to pivot about an axis relative to the frame body independently from a backrest member such that the seat member pivots between a neutral position and an elevated position, wherein the elevated position permits a user to transition between sitting and standing with ease by reducing musculoskeletal stress on the user. In FIG. **2**, seat member **101** is in an elevated position.

Referring now to FIGS. **3-5**, a bottom view of chair assembly **100** is illustrated to demonstrate the optional features of a base member.

In FIGS. **3-5**, base member **109** is in communication with frame body **115**, wherein base member **109** is configured to pivot about axis **119** relative to frame body **115**, and wherein pivoting about axis **119** rotates the orientation of frame body **115**, backrest **105**, and seat member **101**. In these figures, base member **109** is coupled to swivel plate **117**, swivel plate **117** is coupled to hinge **111** (having axis **119**), and hinge **111** is likewise coupled to frame body **115**, thereby permitting coupled base member **109** and swivel plate **117** to pivot about axis **119** relative to frame body **115** by virtue of hinge **111**.

In FIGS. **3-5**, frame body **115** is configured to translate along base member **109**. For example, in FIGS. **3-5**, base member **109** is coupled to swivel plate **117** using a set of track co-members **121***a-b*, wherein track member **121***a* is coupled to swivel plate **117** and track member **121***b* is coupled to base member **109**, and wherein track co-members **121***a-b* are configured to translate linearly with respect to each other via roller bearings.

FIG. **3** depicts chair assembly **100** in a neutral position.

FIG. **4** illustrates coupled swivel plate **117** and base member **109** permitted to pivot with about axis **119** with respect to frame body **115** by virtue of hinge **111**.

FIG. **5** illustrates base member **109** permitted to translate with respect to frame body **115** by virtue of track co-members **121***a-b* coupled between base member **109** and swivel plate **117**.

Optionally, chair assembly **100** includes a brake lever that is pivotably connected to frame body **115**, wherein the brake lever is in communication with a set of brake members that are configured to selectively resist base member **109** from pivoting and/or translating with respect to frame body **115**. For example, in FIG. **3**, chair assembly **100** includes brake lever **108**, brake member **123***a*, and brake member **123***b*, wherein brake lever **108** is in communication with brake members **123***a-b*.

In this figure, brake lever **108** is pivotably connected to frame body **115**. In general, brake member **123***a* is located between frame body **115** and base member **109**. In this example, brake member **123***a* is coupled to frame body **115** and selectively engages against swivel plate **117** to resist swivel plate **117** from pivoting about axis **119**. In this figure, brake member **123***a* is configured to selectively resist base

member **109** from pivoting about axis **119**, wherein rotation of brake lever **108** corresponds to brake member **123***a* selectively resisting base member **109** from pivoting about axis **119**.

In general, brake member **123***b* is located between frame body **115** and base member **109**. In this example, brake member **123***b* is coupled to swivel plate **117** and selectively engages against base member **109** to resist base member **109** from translating with respect to swivel plate **117**. In this figure, brake member **123***b* is configured to selectively resist base member **109** from translating with respect to frame body **115**, wherein rotation of brake lever **108** corresponds to brake member **123***b* selectively resisting base member **109** translating with respect to frame body **115**.

Referring now to FIG. **6**, a side view of chair assembly **100** is depicted.

In this figure, internal components of chair assembly **100** are depicted in relation to seat member **101**, armrest **103***a*, backrest **105**, chair frame **115**, all interconnected via frame body **115**, as well as depicting the optional features of base member **109** and hinge **111** that permits frame body **115** to pivot about axis **119**. Internal components of chair assembly **100** are further detailed with respect to FIGS. **7-9**.

Referring now to FIG. **7**, a cutaway view of chair assembly **100** with the seat member in a neutral position is depicted.

In general, chair assembly further comprises frame body **115**, backrest member **105**, seat member **101**, and motor **131**. In general, chair assembly **100** has backrest **105** rigidly coupled to frame body **115**. Seat member **101** is coupled to frame body **115** and is configured to pivot about axis **137** relative to frame body **115** such that seat member **101** is permitted to pivot independently from backrest member **105**. Motor **131** is in mechanical communication between frame body **115** and seat member **101**, wherein motor **131** selectively pivots seat member **101** about axis **137**.

In this Figure, motor **131** pivots seat member **101** via a screw jack **133**, wherein screw jack **133** has opposing ends **135***a-b* coupled between frame body **115** and seat member **101**. In this Figure, motor **131** is coupled to seat member **101** between opposing ends **151***a-b* of seat member **101**.

Seat member **101** includes, but is not limited to, brackets **141***a-b* and linkage members **143***a-b*. In this figure, bracket **141***a* is coupled to frame body **115**, bracket **141***b* is coupled to seat member **101**, and linkage members **143***a-b* are pivotably connected between brackets **141**-*b*. In other words, linkage member **143***a* is coupled to bracket **141***a* and is permitted to pivot about axis **139***c* relative to bracket **141***a*, linkage member **143***a* is coupled to bracket **141***b* and is permitted to pivot about axis **139***d* relative to bracket **141***b*, linkage member **143***b* is coupled to bracket **141***a* and is permitted to pivot about axis **139***a* relative to bracket **141***a*, and linkage member **14***b* is coupled to bracket **141***b* and is permitted to pivot about axis **139***b* relative to bracket **141***b*. The coupled combination of brackets **141***a-b* and linkage members **143***a-b* with associated axis **139***a-c* result in seat member **101** being restricted to a degree of freedom such that seat member **101** pivots about axis **137**.

Referring now to FIGS. **8** and **9**, a cutaway view of chair assembly **100** with seat member **101** in transit between the neutral and the elevated positions is depicted in FIG. **8** and the seat member **101** located at an elevated position is depicted in FIG. **9**. In these figures, motor **131** pivots seat member **101** about axis **137** by expanding or contracting screw jack **133**, wherein the combination of brackets **141***a-b* and linkage members **143***a-b* restrict seat member **101** to pivot about axis **137**.

Referring now to FIG. **10**, a functional block diagram illustrating a network environment **200** is depicted.

In this figure, power supply **151**, motor **131**, and controller **107** are electrically interconnected via wire connections. Power supply **151** can be a battery or electrical power transformer that supplies electrical power to the components depicted in network environment **200**. Controller **107** is a controller that operates motor **131**, wherein controller **107** operation of motor **131** includes, but it not limited to, regulating the speed of the motor and regulating the direction of motion of seat member **101**. Optionally, controller **107** and control heating element **153**, wherein heating element **153** is a seat heater located within seat member **101**.

As a method of use for chair assembly **101**, a user sits on seat member **101** of chair assembly **100**. In this step, the user sits on seat member **101** by leaning on seat member **101** of the chair assembly while seat member **101** is in an elevated position, then engaging motor **131** via controller **107**, wherein engagement of motor **131** pivots seat member **101** towards backrest member **105**. Alternatively, the user may directly sit in seat member **101** while seat member **101** is in a neutral position.

To exit chair assembly **100**, the user engages motor **101** via controller **107**, wherein engagement of motor **131** pivots seat member **101** to an elevated position away from backrest member **105**, and then separates from seat member **101** by standing.

The particular embodiments disclosed above are illustrative only, as the application may be modified and practiced in different but equivalent manners apparent to those skilled in the art having the benefit of the teachings herein. It is therefore evident that the particular embodiments disclosed above may be altered or modified, and all such variations are considered within the scope and spirit of the application. Accordingly, the protection sought herein is as set forth in the description. It is apparent that an application with significant advantages has been described and illustrated. Although the present application is shown in a limited number of forms, it is not limited to just these forms, but is amenable to various changes and modifications without departing from the spirit thereof.

What is claimed is:

1. A chair assembly, comprising:

a frame body;

a backrest member and a pair of armrests coupled to the frame body;

a base member including a pair of track members defining a length and a swivel plate, the swivel plate configured to longitudinally translate along the length relative to the base member via the pair of track members;

a swivel mechanism defining a vertical axis, the swivel mechanism coupled to the frame body and the swivel plate, the swivel mechanism allowing the frame body to rotate about the vertical axis relative to the base member;

a seat member pivotally coupled to the frame body and configured to pivot about a horizontal axis relative to the frame body independently from the backrest member and the pair of armrests such that the backrest member and the pair of armrests fail to move when the seat member is pivoting, the seat member pivoting between a neutral position and an elevated position;

a motor in mechanical communication with the frame body and the seat member, wherein the motor selectively pivots the seat member about the horizontal axis relative to the frame body; and

a controller in electrical communication with the motor, wherein the controller selectively engages the motor to pivot the seat member about the horizontal axis;

wherein the seat member is configured to be pivoted between the neutral position and the elevated position at any longitudinal position and at any rotational orientation of the frame body relative to the base member.

2. The assembly of claim **1**, wherein the motor is coupled with the frame body and the seat member and further comprises a screw jack.

3. The assembly of claim **2**, wherein the screw jack has opposing ends coupled to the frame body and the seat member.

4. The assembly of claim **1**, wherein the motor is coupled to the seat member between opposing ends of the seat member.

5. The assembly of claim **1**, wherein the seat member further comprises:

a first bracket coupled to the frame body;

a second bracket member coupled to the seat member; and

a set of linkage members pivotably connected to the first bracket and pivotably connected to the second bracket.

6. The assembly of claim **1**, wherein the controller regulates the speed of the motor.

7. The assembly of claim **1**, wherein the controller regulates the direction of motion of the seat member.

8. The assembly of claim **1**, wherein

the base member is coupled to the frame body via the swivel mechanism, the base member configured to pivot about the vertical axis relative to the frame body, pivoting about the vertical axis rotates the orientation of the backrest member and the seat member collectively.

9. The assembly of claim **8**, wherein the frame body is configured to translate along the base member.

10. The assembly of claim **8**, wherein the controller regulates the speed of the motor.

11. The assembly of claim **8**, wherein the controller regulates the direction of motion of the seat member.

12. The assembly of claim **1**, wherein the base member is coupled with the frame body via the swivel mechanism, the swivel plate and the frame body configured to translate along a track formed by the pair of track members of the base member.

13. A method of using a chair assembly, comprising:

obtaining the chair assembly of claim **1**;

sitting on the seat member of the chair assembly;

engaging the motor via the controller, wherein engagement of the motor pivots the seat member to an elevated position away from the backrest member, the seat member moving relative to fixed positions of the pair of armrests and the backrest member; and

separating from the seat member by standing.

14. The method of claim **13**, further comprising:

leaning on the seat member of the chair assembly; and

engaging the motor via the controller, wherein engagement of the motor pivots the seat member towards the backrest member.

15. The assembly of claim **8**, further comprising:

a brake lever pivotably connected to the frame body;

a brake member located between the frame body and the base member, the brake member configured to selectively resist the base member from pivoting about the vertical axis, the brake member coupled with the brake lever, wherein rotation of the brake lever activates the brake member for selectively resisting the base member from pivoting about the vertical axis.

16. The assembly of claim **9**, further comprising:

a brake lever pivotably connected to the frame body;

a brake member located between the frame body and the base member, the brake member configured to selectively resist the base member from pivoting about the vertical axis, the brake member coupled with the brake lever, wherein rotation of the brake lever activates the brake member for selectively resisting the base member from pivoting about the vertical axis; and

a second brake member located between the frame body and the base member, the second brake member configured to selectively resist the frame body from translating along the base member, the second brake member coupled with the brake lever, wherein rotation of the brake lever activates the second brake member for selectively resisting the frame body from translating along the base member.

17. The assembly of claim **12**, further comprising:

a brake lever pivotably connected to the frame body; and

a brake member located between the frame body and the base member, the brake member configured to selectively resist the frame body from translating along the base member, the brake member coupled with the brake lever, wherein rotation of the brake lever activates the brake member for selectively resisting the frame body from translating along the base member.

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